

ABSTRACT OF THE DISCLOSURE

A mixing apparatus is provided comprising: first driving means for driving a plurality of reagent samples from a plurality of respective source wells into a first fluid flow stream; second driving means for introducing a separation gas between each of the plurality of reagent samples in the first fluid flow stream; means for driving a second fluid flow stream comprising a plurality of particles; a junction device comprising: a first inlet port for receiving the first fluid flow stream; a second inlet port for receiving the second fluid flow stream; a reaction zone for forcing mixing between the first fluid flow stream and the second fluid flow stream to thereby form a reaction product stream; and an outlet port for allowing the reaction product stream to exit the junction device; a reaction zone where the plurality of reagent samples and the plurality of particles mix to form a plurality of reaction products, the reaction zone communicating with the outlet port; reaction product driving means for driving the reaction product stream through the reaction zone; and means for selectively analyzing the reaction product stream for the reaction products. A method for mixing materials is also provided comprising: driving a first fluid flow stream comprising a plurality of reagent samples separated by gas bubbles through a second inlet port of a junction device; driving a second fluid flow stream comprising particles through a first inlet port of the junction device; mixing the first fluid flow stream and the second fluid flow stream in a reaction zone in the junction device to form a reaction product stream; and driving the reaction product stream through an outlet port of the junction device.